



2011 Minerals Yearbook

BAHRAIN

THE MINERAL INDUSTRY OF BAHRAIN

By Mowafa Taib

The Kingdom of Bahrain is one of the six countries that make up the Cooperation Council for Arab States of the Gulf, better known as the Gulf Cooperation Council (GCC). Bahrain, which has an area of 760 square kilometers, is an island country and is the smallest country in the Middle East region. Bahrain is connected to Saudi Arabia by a causeway. Another causeway that would connect Bahrain and Qatar was in the planning stages. Bahrain was the site of one of the largest aluminum smelters in the world in terms of the volume of production. The country was the world's ninth ranked producer of primary aluminum in 2011 and accounted for 2.0% of the world's aluminum output (Bray, 2012). Other mineral commodities produced in Bahrain included ammonia, cement, crude oil, iron ore pellets from imported iron ore, ferromanganese, ferrosilicon, methanol, natural gas, refined petroleum products, sulfur, and urea (table 1). In 2011, Bahrain was subjected to incidents of civil unrest and political turmoil that were inspired partially by the revolutions in Egypt and Tunisia and partially by local discontent with Government policies (U.S. Department of State, 2012).

Minerals in the National Economy

In 2011, Bahrain's gross domestic product (GDP) increased by 1.8% in real terms compared with an increase of 4.5% in 2010. The mineral sector, which included the production of natural gas and oil as well as quarrying activity, accounted for about 29.6% of the GDP at current prices; the manufacturing sector, which included aluminum and iron and rolled steel production, accounted for 16.8% of the GDP; and the construction sector accounted for about 6.6% of the GDP. The Government's gas and oil revenue accounted for 87.9% of the country's GDP in 2011 compared with 85.1% in 2010. Bahrain's exports of goods and services were valued at \$16.8 billion in 2011 compared with a revised \$13.6 billion in 2010. The value of petroleum products exports increased by 26% to about \$12.9 billion in 2011 from a revised \$10.2 billion in 2010, and the value of oil imports increased by 29% to about \$7.5 billion from \$5.8 billion in 2010 (Central Bank of Bahrain, 2012, p. 67, 76, 79; International Monetary Fund, 2012, p. 5, 11).

In 2011, the value of U.S. exports of goods to Bahrain decreased by 3% to \$1.21 billion from \$1.25 billion in 2010 and the value of U.S. imports from Bahrain increased by 23% to \$518 million from \$420 million in 2010. U.S. exports included mainly civilian aircraft, industrial engines, and machinery. Bahrain's exports to the United States included mainly nitrogen fertilizer (\$152 million), aluminum (\$72 million), and finished metals (\$26 million) (U.S. Census Bureau, 2012a, b).

Production

Primary aluminum output, which was produced solely by Aluminium Bahrain B.S.C. (Alba), increased by 3.6%

compared with that of 2010. Production of iron ore pellets by Gulf Industrial Investment Co. E.C. (GIIC) from imported iron ore increased by 38% compared with that of 2010 as a result of GIIC's second iron ore pelletizing plant at the Hidd Industrial Area producing at full capacity. Gulf Petrochemical Industries Co. B.S.C. (GPIC) reported a 6% increase (on average) in ammonia, methanol, and urea production compared with that of 2010. Ferromanganese output increased by 530% compared with that of 2010, and ferrosilicon decreased by 19% (table 1).

Structure of the Mineral Industry

The National Oil and Gas Authority (NOGA) was the Government agency that was responsible for making policy, issuing regulations, and controlling the use of Bahrain's hydrocarbon resources. NOGA Holding Co. was NOGA's business and investment wing and the Government's shareholder in such companies as Bahrain Petroleum Co., B.S.C. (Closed) (Bapco) (100% interest); Bahrain National Gas Co., B.S.C. (Banagas) (75% interest); Bahrain Aviation Fueling Co. (Bafco) (60% interest); and Bahrain Lube Base Oil Co. (55% interest). GPIC was a joint venture for fertilizer and petrochemical production, which was equally owned by NOGA, Petrochemical Industries Co. of Kuwait, and Saudi Basic Industries Corp. (Sabic) of Saudi Arabia. Tatweer Petroleum was a joint venture of NOGA, Mubadala Development Co. of the United Arab Emirates, and Occidental Petroleum Corp. of the United States that was created to increase crude oil production from the Bahrain oilfield and to meet Bahrain's future energy demands according to Bahrain's Economic Vision 2030 plan (Tatweer Petroleum, 2012).

In 2010, Alba was converted into a public company through an initial public offering and was listed on the Bahrain Bourse and the London Stock Exchange. Alba's shares were distributed among Government-owned Mumtalakat Holding Co. (69.38%), Sabic Industrial Investments Co. Ltd. of Saudi Arabia (20.62%), and others (10%) (Aluminium Bahrain B.S.C., 2012, p. 4, 9).

GIIC, which was established in Bahrain by Gulf United Steel Holding Company B.S.C (Foulath) as an integrated iron and steel producer, was a joint venture of Gulf Investment Corp. of Kuwait (50%); Qatar Steel Co., (25%); M.A. Al-Kharafi Group of Kuwait and National Industries Group of Kuwait (10% each); and Kuwait Foundry Co. (5%). GIIC operated two Allis-Chalmers (grate-kiln) pelletizing plants with a combined production capacity of 11 Mt/yr of iron ore pellets for use in direct-reduced iron (DRI) plants [Gulf Industrial Investment Co. (E.C.), 2012].

Foulath owned a majority interest in GIIC, United Stainless Steel Co. B.S.C. (USCO), and United Steel Co. B.S.C. (SULB), which was a joint venture with Yamato Kogyo Co. of Japan. Falcon Cement Co. (a subsidiary of Cemena Holding Co. B.S.C. of Bahrain) and Star Cement Co. W.L.L. of the

United Arab Emirates were the only cement producers in Bahrain [Gulf Industrial Investment Co. (E.C.), 2012].

Commodity Review

Metals

Aluminum.—Alba produced 881,310 metric tons (t) of primary aluminum products in 2011, which was a historical record for the company despite the political unrest that took place in the country in the first quarter of 2011. The company, which employed 2,777 people in 2011 compared with 3,000 in 2010, had dismissed 228 workers as a result of the protests that took place in the country during the first quarter of 2011 according to the Bahrain Independence Commission of Inquiry (Aluminium Bahrain B.S.C., 2012; Martin, 2012, p. 39).

Alba's mix of aluminum products included extrusion billet (35%), liquid metal (27%), rolling slabs (14%), foundry alloys (13%), and standard ingots (11%). About one-half of the company's output was used locally and the remainder was exported. Alba exported 21% of its aluminum production to Asian markets, 20% to other countries in the Middle East, and 9% to European markets. Bahraini downstream industries included Gulf Aluminium Rolling Mill Co., which had the capacity to produce 165,000 metric tons per year (t/yr) of aluminum material (35,000 t/yr of which was aluminum foil), Bahrain Aluminium Extrusion Co. (Balexco), Bahrain Atomisers International B.S.C., and Midal Cables Ltd. Alba imported more than 1 million metric tons per year (Mt/yr) of alumina, which was supplied by Alcoa Inc. of the United States under a long-term agreement (Aluminium Bahrain B.S.C., 2012, p. 17).

Iron and Steel.—In 2011, Universal Rolling W.L.L. (Unirol), which was owned by Bahraini and Saudi investors, and the Bahrain-based International Investment Bank, produced steel-reinforcing bar (rebar) from its mill at the Hidd Industrial Area. The production capacity of the mill was 200,000 t/yr of rebar. USCO, which had the capacity to produce 100,000 t/yr of stainless steel at its plant in the Hidd Industrial Area, produced 90,000 t of stainless steel from imported black hot-band coils (Universal Rolling W.L.L., 2012).

In April, GIIC inaugurated the \$700 million pelletizing plant No. 2 at the Hidd Industrial Area near the existing 5-Mt/yr-capacity pelletizing plant No. 1; the new plant had the capacity to produce 6 Mt/yr of iron ore pellets and 100,000 t/yr of stainless steel. The combined capacity of the two iron pelletizing plants was 11 Mt/yr of iron ore pellets [Gulf Industrial Investment Co. (E.C.), 2012].

The SULB joint venture of Foulath (51%) and Yamato Kogyo Co. Ltd. of Japan (49%) moved forward with building a \$1 billion steel mill at the Hidd Industrial Area. SULB comprised a three-module mill, which included a 1.5-Mt/yr-capacity direct-reduced iron (DRI) plant, a melt shop with a combined capacity of 970,000 t/yr, and a 600,000-t/yr-capacity heavy-section rolling mill. Development of the SULB iron and steel complex was expected to be completed by the first quarter of 2013 (Arab Steel, 2012).

In January, Ahmed Mansoor Al-Aali Co. (AMA) of Bahrain shelved a plan to build a \$200 million steel minimill in

Bahrain. The minimill would have had the capacity to produce 500,000 t/yr of steel upon completion. No reason was given for the cancellation (Baxter, 2011).

Bahrain Ferro Alloys B.S.C., which was commissioned in 2008, produced high-carbon ferrochrome, ferromanganese, and ferrosilicon for use in steel production at its plant in Hidd. The company was a subsidiary of ETA Star Holdings L.L.C. of the United Arab Emirates (Bahrain Ferro Alloys B.S.C., 2012).

Industrial Minerals

Cement.—In 2011, Falcon Cement Co., which was owned by Cemena Holding Company B.S.C. of Bahrain, produced cement from its plant located in the Hufaira Industrial Area at a rate of 1,000 metric tons per day (t/d). Falcon planned to increase its capacity to 1.2 Mt/yr of cement by 2012. Star Cement, which operated a clinker-grinding mill in Bahrain and had the capacity to produce to 500,000 t/yr of cement, was owned by UltraTech Cement Middle East Investments Ltd. of India and produced 1,200 t/d of cement (Falcon Cement Co. B.S.C., 2012).

Nitrogen.—In 2011, GPIC, which was the sole producer of ammonia and urea in Bahrain, produced 458,000 t (380,000 t of nitrogen content) of ammonia and 674,000 t of urea (310,000 t of nitrogen content). Most of the company's production was for export. Fifty-three percent of Bahrain's ammonia exports, which amounted to 72,000 t, went to India, and the remaining 43% went to the Republic of Korea. GPIC exported about 664,000 t of urea, 43% (352,600 t) of which went to the United States. Other destinations included Africa and Australia, which accounted for 13% each of Bahrain's urea exports; India, 12%; and Pakistan, Thailand, and Vietnam, 3% each. GPIC moved forward with its \$700 million expansion plan to increase its production capacity to 766,500 t/yr of ammonia and 1.3 Mt/yr of urea. The volume of GPIC's exports of ammonia was about 72,000 t in 2011 (Gulf Petrochemical Industries Co. B.S.C., 2012, p. 27).

Mineral Fuels

Natural Gas and Petroleum.—Bahrain's proven crude oil reserves were estimated to be 125 million barrels (Mbbbl), and its proven natural gas reserves were estimated to be 218 billion cubic meters as of yearend 2010. In 2011, Bahrain's petroleum production comprised 15.5 Mbbbl from the Bahrain oilfield, which was operated by Bapco, and 53.9 Mbbbl from Bahrain's 50% share of the Abu Safaa offshore oilfield; the Abu Safaa field was owned jointly by Bahrain and Saudi Arabia and operated by Saudi Arabian Oil Co. Banagas produced 15.6 billion cubic meters of natural gas, which was slightly less than the output in 2010. In 2011, Tatweer Petroleum increased crude oil production from the Bahrain field by 33% compared with that of 2010 and planned to double production in 5 years (Central Bank of Bahrain, 2012, p. 6; U.S. Energy Information Administration, 2011; Tatweer Petroleum, 2012).

The Government planned to build a liquefied natural gas import terminal and to import 14.2 million cubic meters per year of natural gas to satisfy its future natural gas needs. In November, a \$430 million lube oil plant was commissioned by Bahrain Lube Base Oil Co., which was a majority state-owned

company. The Government's share (55%) was equally divided between NOGA Holding Co. and Bapco (27.5% each); Neste Oil Corp. of Finland owned the remaining 45%. The plant was considered the first of its kind in the region (National Gas and Oil Authority, 2012).

Bapco postponed the startup of engineering work for construction of a pipeline that would transport crude oil from Saudi Arabia to the Sitra refinery in Bahrain till 2013. The pipeline would be more than a 100 kilometers long, and would cost \$350 million to build. The company was planning to increase production capacity at its oil refinery in Sitra to 450,000 barrels per day (bbl/d) from 265,000 bbl/d by 2018. The expansion project was expected to cost between \$5 billion and \$6 billion to build (Petroleum Developments Monthly, 2012; Zawya, 2012; Arab News, 2013).

Outlook

Political stability is expected to be a significant factor for Bahrain's sustainable economic development. The GCC announced a \$10 billion aid package for Bahrain during the next 10 years. The Government expected that the country would receive \$20 billion in direct investment in the next 15 years. Bahrain is likely to remain a significant world producer of aluminum and a regional hub for the iron ore and steel beneficiation industries.

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TABLE 1
BAHRAIN: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons unless otherwise specified)

Commodity ²	2007	2008	2009	2010	2011	
METALS						
Aluminum metal, primary	865	872	848	851 ^{r,3}	881	
Iron ore pellets ⁴	5,000 ^e	3,839	3,286	8,000	11,000	
Ferromanganese	metric tons	--	5,700	5,600	35,300	
Ferrosilicon	do.	--	6,500	3,700	3,000	
INDUSTRIAL MINERALS						
Cement	400	438	700	700	800	
Nitrogen, N content of:						
Ammonia	346	393	390	357 ^{r,3}	380	
Urea	269	287	332	290 ^{r,3}	310	
Sulfur ^e	72	72	72	72	72	
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural:						
Gross	million cubic meters	14,376	15,241	15,388	15,762	15,641
Dry	do.	11,800 ^{r,3}	12,600 ^{r,3}	9,800 ^{r,3}	10,200 ^{r,3}	10,400
Methanol		371	410	410	417	443
Natural gas plant liquids:						
Propane	thousand 42-gallon barrels	944	949	953	990	990
Butane	do.	896	920	907	908	908
Naphtha	do.	1,663	1,699	1,730	1,760	1,760
Petroleum:						
Crude ⁵	do.	67,262	66,864	66,510	66,376	69,452
Refinery products:						
Liquefied petroleum gas	do.	950	1,095	365 ^{r,3}	548 ^{r,3}	584
Gasoline	do.	6,350	7,300	7,600	7,600	6,205
Kerosene and Jet fuel	do.	1,716 ^{r,3}	2,716 ^{r,3}	1,716 ^{r,3}	1,606 ^{r,3}	1,168
Distillate fuel oil	do.	35,332	32,850	32,120 ^{r,3}	31,755 ^{r,3}	28,470
Residual fuel oil ^e	do.	15,768	15,002	15,330	15,330 ^{r,3}	16,279
Other ^e	do.	37,850 ^r	36,813 ^r	38,377 ^r	42,523 ^r	43,320
Total	do.	97,966	95,776	95,508	99,362	96,026

^eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through December 31, 2012.

²Aggregate, sand, and rock are also produced, but available information is inadequate to make estimates of output.

³Reported figure.

⁴Pellets were produced from imported iron ore and exported for use by direct-reduction plants.

⁵Includes Bahrain's share of production from the Abu Saafa field of 53,936,000 42-gallon barrels.

TABLE 2
BAHRAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2011

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum:				
Metal:				
Primary and secondary		Aluminium Bahrain B.S.C. (Alba) (Bahrain Mumtalakat Holding Co., 69.38.5%; SABIC Industrial Investments Co. Ltd., 20.62%; others, 10%)	Smelter at Sitra	880,000
Secondary		Bahrain Recycling Plant (private, 100%)	Dross and scrap remelt facilities at Askar	NA
Rolled products		Gulf Aluminium Rolling Mill Co. B.S.C. (Closed) (Bahrain Mumtalakat Holding Co., 38%; Saudi Basic Industries Corp., 30%; Industrial Bank of Kuwait, 17%; Gulf Investment Corp., 6%; Government of Iraq, 5%; Government of Oman, 2%; Government of Qatar, 2%)	Rolling mill at Sitra	165,000
Do.		Midal Cables Ltd. (Intersteel W.L.L., 50%, and Saudi Cable Co., 50%)	Rolling mill at Manama	120,000
Cement				
		Star Cement Co. W.L.L.	Clinker grinding mill at Hidd	450,000
Do.		Falcon Cement Co.	Hufaira	365,000
Iron and steel:				
Iron ore, pellets		Gulf Industrial Investment Co. (E.C.) (GIIC) [Gulf United Steel Holding Co. (Foulath)]	Pellet plant at Hidd	11,000,000
Steel, stainless, rolled		Universal Rolling W.L.L. (Unirol)	Hidd	200,000
Do.		United Stainless Steel Co. B.S.C. [Gulf United Steel Holding Co. (Foulath)]	do.	100,000
Methanol				
		Gulf Petrochemical Industries Co. B.S.C. [National Oil and Gas Authority (NOGA), 33.3%; Petrochemical Industries Co., 33.3%; Saudi Basic Industries Corp., 33.3%]	Sitra	438,000
Natural gas:				
Extracted	million cubic meters	Bahrain Petroleum Co., B.S.C. (Bapco) (Closed) (Government)	Bahrain field, Awali	13,900
Liquids:				
Butane	thousand 42-gallon barrels	Bahrain National Gas Co. B.S.C. (Banagas) [National Oil and Gas Authority (NOGA), 75%; Arab Petroleum Investment Corp., 12.5%; Caltex Bahrain, 12.5%]	Natural gas plant at Awali	1,100
Naphtha	do.	do.	do.	1,020
Propane	do.	do.	do.	1,800
Nitrogen:				
Ammonia		Gulf Petrochemical Industries Co. B.S.C. (GPIC) [National Oil and Gas Authority (NOGA), 33.3%; Petrochemical Industries Co., 33.3%; Saudi Basic Industries Corp., (Sabic) 33.3%]	Sitra	438,000
Urea		do.	do.	621,000
Petroleum:				
Synthetic coke		Aluminium Bahrain B.S.C. (Alba) (Bahrain Mumtalakat Holding Co., 77%; SABIC Industrial Investments Co. Ltd., 20%; Breton Investments Ltd., 3%)	do.	600,000
Crude	thousand 42-gallon barrels	Saudi Arabia Oil Co.	Abu Saafa field, offshore	54,741 ¹
Do.	do.	Bahrain Petroleum Co., B.S.C. (Closed) (Bapco) [National Oil and Gas Authority (NOGA), 100%]	Bahrain field, Awali	11,635
Refined products	do.	do.	Sitra	99,362
Sulfur		do.	do.	72,000

Do., do. Ditto. NA Not available.

¹Production from the field is pumped to Bahrain and subsequently refined and marketed by Bahrain Petroleum Co.